

23 process for creating an instability and receptivity mechanism for rapid and homogeneous mixing of one or more fluids comprising:

- (a) introducing one or more fluids into a mixing chamber having a [specific] geometry for (enhancing) producing corner flows [corners flow] in said mixing chamber for creating streamwise corner vortices, and having one or more inlets for receiving said fluids and at least one splitter plate having a trailing edge and configured to create corners in said mixing chamber and to create a shear layer between said fluids;
- (b) separating said fluids on entrance into said mixing chamber by said splitter plate creating primary vortices at said trailing edge of said splitter plate;
- (c) forcing said shear layer between said fluids through the periodic application of a narrow frequency band within 10 Hz, said shear layers having a specific receptivity to said narrow frequency band, which can be found through tuning the frequency of the forcing actuators, and independent of said fluid's velocity into said mixing chamber; and
- (d) creating enhanced streamwise vortices for enhanced mixing through the interaction between vortices due to said corners and said primary vortices.

24 process for creating a receptivity [instability] mechanism as claimed in claim wherein said frequency band is generated by a means selected from the group consisting of a forced flap in said trailing edge of at least one splitter plate, a forced membrane, a piston pump and a periodic valve upstream of said trailing edge of at least one splitter plate for forcing the flow [mixing] of at least one fluid stream.